

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of) Examiner: J.R. Roe
Mats Dahlbäck et al.)
Title: Method, Use and Device Concerning)
Cladding Tubes for Nuclear Fuel and a Fuel)
Assembly for a Nuclear Pressure Water Reactor) Art Unit: 1793
Serial No.: 10/533,467)
Filed: April 29, 2005) (Docket No. 1026-0001WOUS)

Middletown, Connecticut, September 3, 2008

Mail Stop AF
Commissioner for Patents
P.O. BOX 1450
Alexandria, VA 22313-1450

AMENDMENT

This Amendment with Remarks is submitted in response to the final Office Action mailed July 3, 2008, having a period for response set to expire on October 3, 2008. Applicants respectfully request entry of amendments presented herein and reconsideration of the outstanding rejections in view of the following remarks.

Proposed Amendments to the Claims are reflected in a listing of the claims that begins on page 2 of this paper.

Remarks begin on page 4 of this paper.

IN THE CLAIMS

A presentation of all of the pending claims with their current status indicated follows.

1-23. (Cancelled)

24. (Currently amended) A method of producing a cladding tube for nuclear fuel for a nuclear pressure water reactor, which method comprises the following steps:

formation of a tube which at least principally consists of a cylindrical tube component of a Zr-based alloy, where the alloying element, except for Zr, which has the highest content in the alloy is Nb, wherein the Nb content in weight percent is between about 0.5 and about 2.4 and wherein no alloying element, except for Zr and Nb, in said alloy, has a content which exceeds about 0.2 weight percent, and finally annealed the cladding tube at a temperature and during a time such that said tube component is partly recrystallized but not completely recrystallized, and wherein said final anneal is carried out such that the degree of recrystallization in said tube component is higher than about 40% and lower than about 95%;

wherein before said final anneal, the method comprises the following steps:

forming a bar of said Zr-based alloy;

heating the bar to between about 900°C and about 1300°C and then quenching the bar;

extruding a billet from the bar after heating to between about 500°C and about 900°C;
and

cold rolling the billet into a tube in at least two steps, with heat treatments between them at between about 550°C and about 650°C.

25-26. (Cancelled).

27. (Previously presented) A method according to claim 24, wherein the final anneal is carried out at a temperature which is lower than 550°C.

28. (Previously presented) A method according to claim 24, wherein the final anneal is carried out at a temperature which is between about 400°C and about 540°C.

29. (Previously presented) A method according to claim 24, wherein the final anneal is carried out during about 1h to about 6h.

30. (Cancelled).

31. (Previously presented) A method according to claim 24, wherein the Nb content in said alloy is between about 0.8 weight percent and about 1.2 weight percent.

32. (Previously presented) A method according to claim 24, wherein said alloy contains between about 800ppm and about 1700ppm O.

33. (Previously presented) A method according claim 24, wherein said alloy contains between about 50ppm and about 600ppm Fe.

34. (Previously presented) A method according claim 24, wherein said alloy in addition to Zr contains about 0.8 weight percent to about 1.2 weight percent Nb, about 50ppm to about 600ppm Fe, about 800ppm to about 1700ppm O, less than about 250ppm C, less than about 150ppm Si, less than about 1000ppm S and in addition to that only impurities of a content which does not exceed that which is normally accepted in Zr or Zr alloys for applications in nuclear reactors.

35-42. (Cancelled).

REMARKS

Claims 24, 25, 27-35, and 37-42 are pending. Claims 24, 25, 27-29, 31-35, 37-42 have been rejected under 35 U.S.C. §103. Claim 30 has been objected to as being dependent upon a rejected base claim but would be allowable if rewritten in independent form to include all the limitations of the base claim and any intervening claims. By this Amendment it is proposed to amend Claim 24. Support for the proposed amendment to Claim 24 is found in Claim 30 as previously presented. It is also proposed to cancel Claims 25, 30, 35, and 37-42. Claims 26 and 36 have been cancelled in previous correspondence. Accordingly, Claims 24, 27-29, and 31-34 remain for consideration upon entry of the present Amendment. No new matter has been added.

The Examiner has objected to Claim 30 as being dependent upon a rejected base claim but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Applicants thank the Examiner for the indication of allowable subject matter and propose to amend Claim 24 (the base claim) to include the subject matter of Claim 30. Therefore, Claim 24 as now written is deemed to be in allowable form. As indicated above, it is proposed to cancel Claim 30. Applicants therefore respectfully request that the Examiner withdraw the objection to the Claim 30 and allow Claim 24 as now written.

In the outstanding Office Action Claims 24, 25, 27-29, and 35 are rejected over U.S. Patent No. 4,718,949 to Takase et al. (hereinafter “Takase”); Claims 32 and 38 are rejected over Takase in view of U.S. Patent No. 3,271,205 to Murgatroyd et al. (hereinafter “Murgatroyd”); Claims 33 and 39 are rejected over Takase with evidence from a journal article published in 1959 entitled “Zirconium Analysis by Production Control Quantometer” by Easterday (hereinafter “Easterday”); Claims 41 and 42 are rejected over U.S. Patent No. 3,607,639 to Van Santen et al. (hereinafter “Van Santen”) in view of Takase; Claims 41 and 42 are also rejected over U.S. Patent No. 5,323,434 to Lorek et al. (hereinafter “Lorek”) in view of Takase; Claims 24, 27-29, 31, 35, and 37 are rejected over European Patent Application No. 0 198 570 to Sabol (hereinafter “Sabol”); Claims 32 and 38 are rejected over Sabol in view of Murgatroyd; Claims 33 and 39 are rejected over Sabol with evidence from Easterday; Claims 34 and 40 are rejected over Sabol with evidence from Easterday and

further in view of Murgatroyd; Claims 41 and 42 are rejected over Van Santen in view of Sabol; and Claims 41 and 42 are also rejected over Lorek in view of Sabol.

As noted above, Claim 24 has been amended to incorporate the subject matter of Claim 30 in accordance with the Examiner's indication that Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Claims 25, 30, 35, and 37-42 have been cancelled, as indicated above. In view of the proposed amendment of Claim 24 (incorporating the subject matter of Claim 30) and the cancellation of Claims 25, 35, and 37-42, Applicants respectfully assert that the rejections of Claims 24, 25, 35, and 37-42 under 35 U.S.C. §103(a) in view of the prior art of record, are moot. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejections of Claims 24, 25, 35, and 37-42.

Claims that depend from a claim that is non-obvious are themselves necessarily non-obvious. Because Claims 27-29 and 31-34 depend from Claim 24 and because Claim 24 is deemed non-obvious and allowable for the reasons presented above, Claims 27-29 and 31-34 are also necessarily non-obvious. Applicants, therefore, respectfully submit that Claims 27-29 and 31-34 are allowable. Accordingly, Applicants respectfully request that the rejections of Claims 27-29 and 31-34 be reconsidered and withdrawn.

Applicants again thank the Examiner for the indication of allowable subject matter. Applicants also believe that the foregoing amendments and remarks are fully responsive to the Office Action and that the claims as now presented herein are allowable. An early action to that effect is earnestly solicited.

If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is invited to telephone the undersigned.

Applicants believe that no fees are due with the submission of this Amendment. However, if any charges are incurred with respect to this Amendment, they may be charged to Deposit Account No. 503342 maintained by Applicants' attorneys.

Respectfully submitted,

By /Richard R. Michaud/
Richard R. Michaud
Registration No. 40,088
Attorney for Applicants

Michaud-Duffy Group LLP
CenterPoint
306 Industrial Park Road
Suite 206
Middletown, CT 06457-1532
Tel: (860) 632-7200
Fax: (860) 632-8269